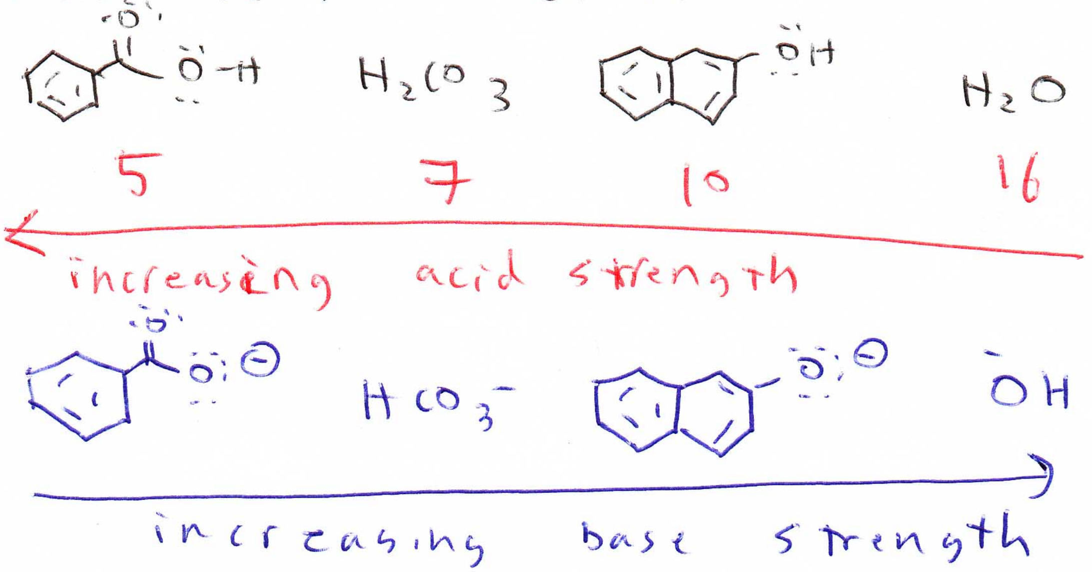
10/28/11

Lab #1 - Extraction

Technique of extraction

Polarity, immiscible, density

Acid-base neutralization



Drying agent, recrystallization, MP

Lab #2 - TLC

Polarity as the basis of separation

Stationary + Mobile phases

Preparing, developing, and visualizing a TLC plate

Interpret R_f values

Lab #4 - Spectroscopy

Mechanism

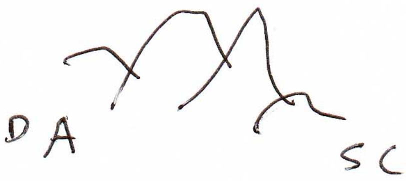
Washes

Outline of IR spectroscopy

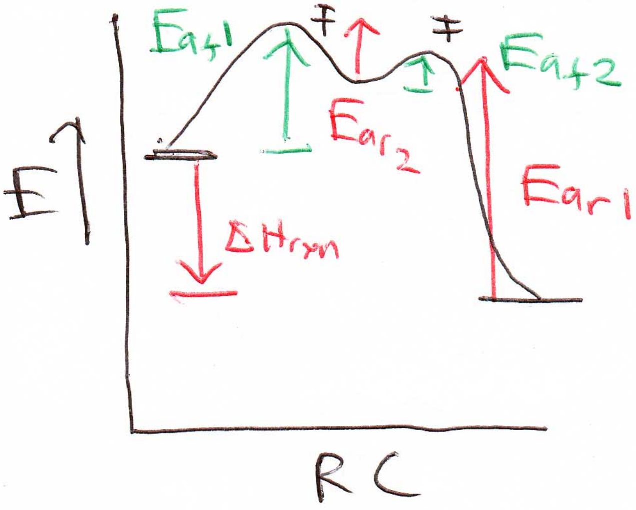
Verification of successful rxn

Principle of microscopic reversibility

- For a reversible rxn, the ~~[illegible]~~ energetically most favorable pathway for the forward rxn will be the same as the reverse rxn.



#2

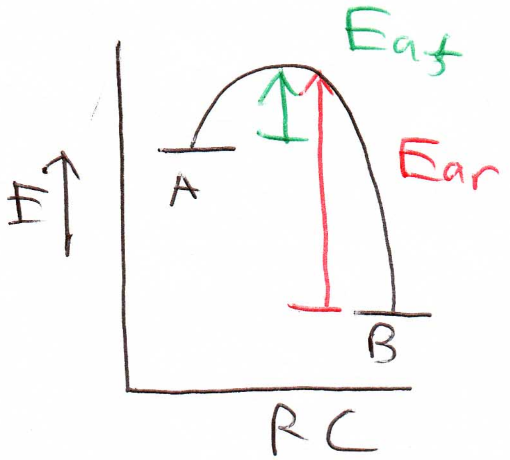


forward: $E_{af1} > E_{af2}$

1st step is RLS

reverse: $E_{ar1} > E_{ar2}$

* 1st step (in reverse) RLS



$R_f = k_f[A]$

$R_r = k_r[B]$

Equilibrium:

thermo 1) the lowest-energy point in a reversible process $\longrightarrow$ $\Delta E = 0$

Kinetic 2) Rate of forward + reverse processes are equal to ~~equal~~ each other.

equil 3) No observable change in the concentration of reactants or products

@ Equilibrium: $R_f = R_r = k_f[A] = k_r[B]$

If all other factors are equal (same T, ignore A), since $E_{ar} > E_{af}$, $k_r < k_f$.

$$\frac{[B]}{[A]} = \frac{k_f}{k_r} \Longrightarrow K$$

← equilibrium constant

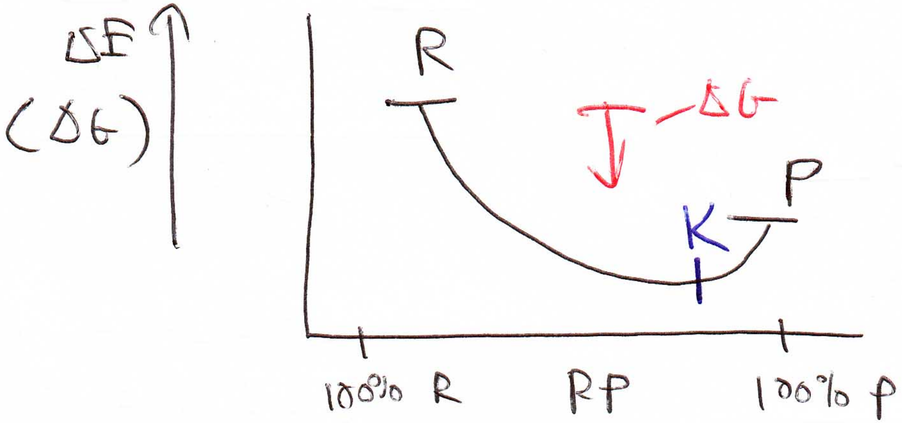
→ balance of products and reactants

$$aA + bB \rightleftharpoons cC + dD$$

$$K = \frac{[C]^c[D]^d}{[A]^a[B]^b}$$

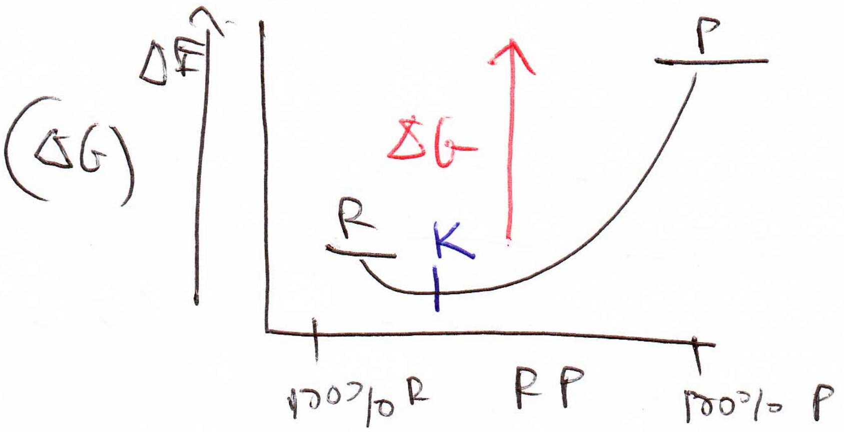
Reaction progress diagram

Measure of the cumulative energy of all instances of a chemical reaction as a solution moves from 100% reactants to 100% products.



$\Delta G < 0 \rightarrow$ exergonic

$\Delta G > 0 \rightarrow$ endergonic



$$\boxed{\Delta G = -RT \ln K}$$